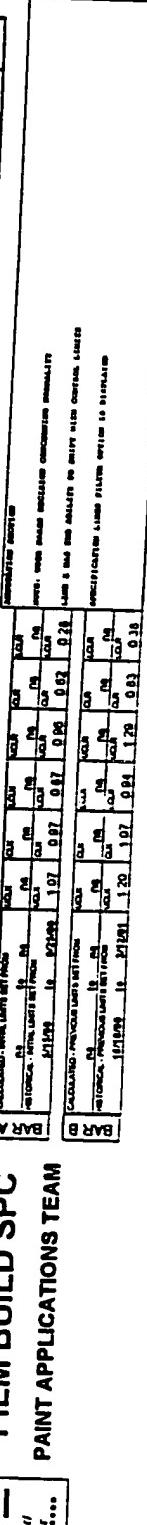
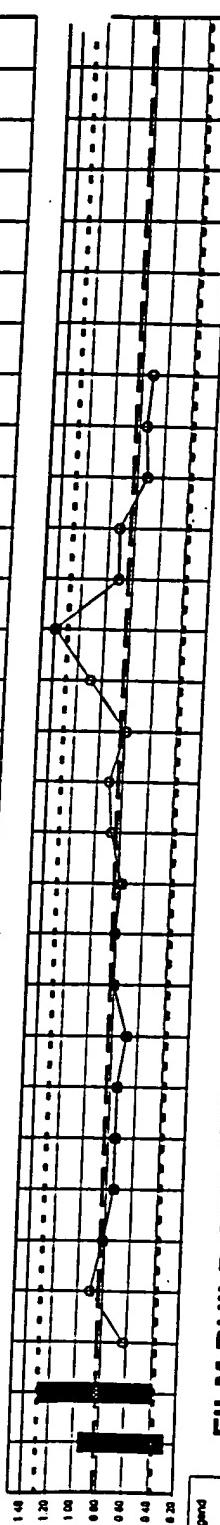
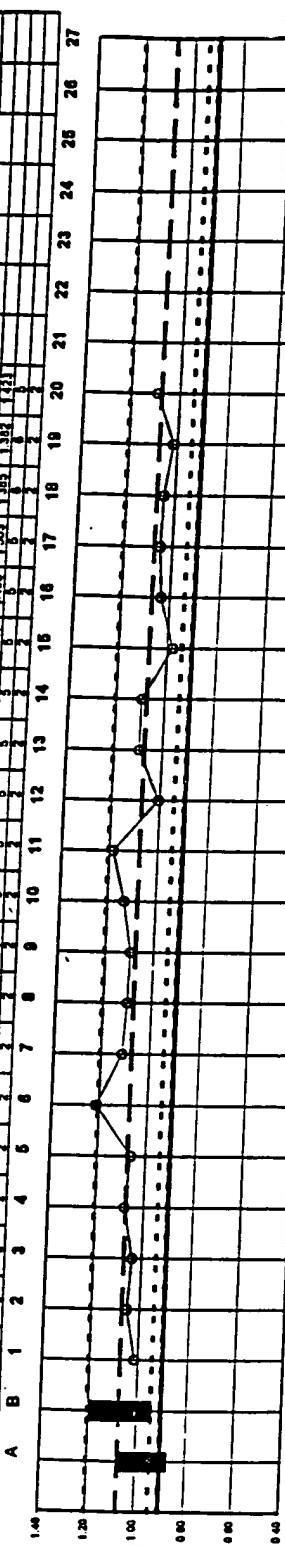


APPENDIX A

CONTROL CHART VARIABLES DATA (X-BAR & R)



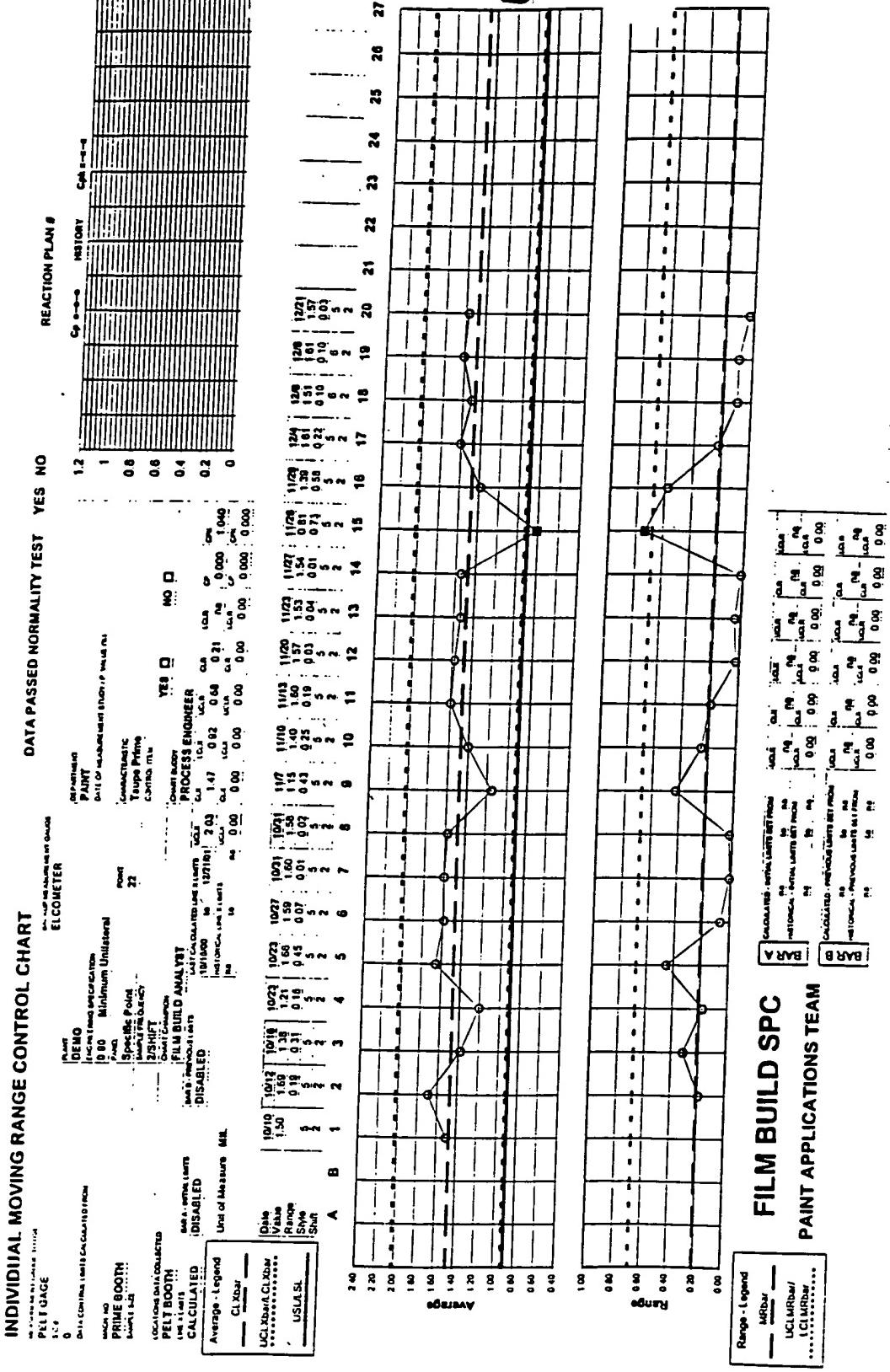
Ridge - legend
Rear -
UCI River/
LCI River
.....

FILM BUILD SPC PAINT APPLICATIONS TEAM

PAINT APPLICATIONS TEAM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

APPENDIX B



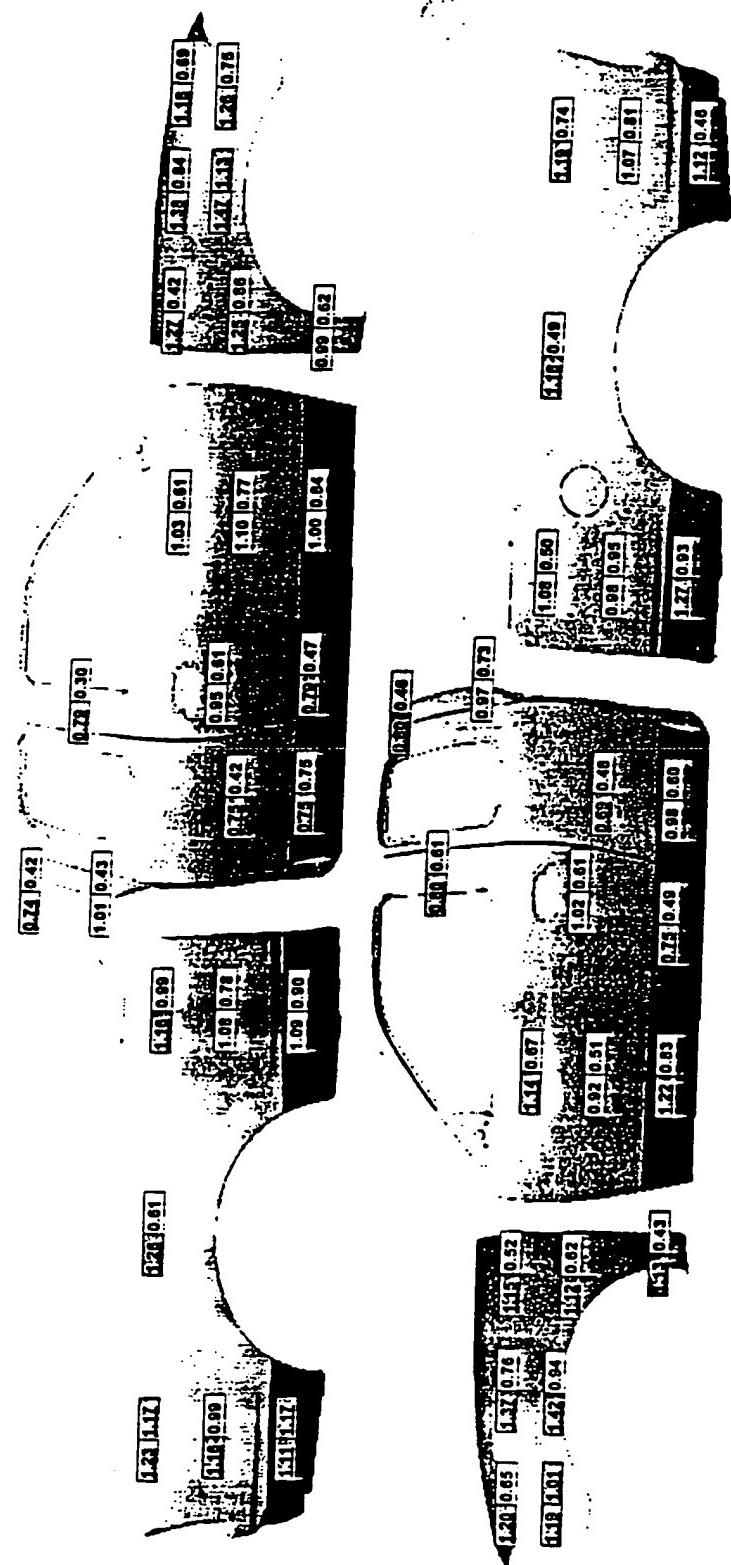
APPENDIX C

FILM BUILD EXECUTIVE SCHEMATIC (RIGHT AND LEFT SIDES)

MEASUREMENT GAUKSE TO USE

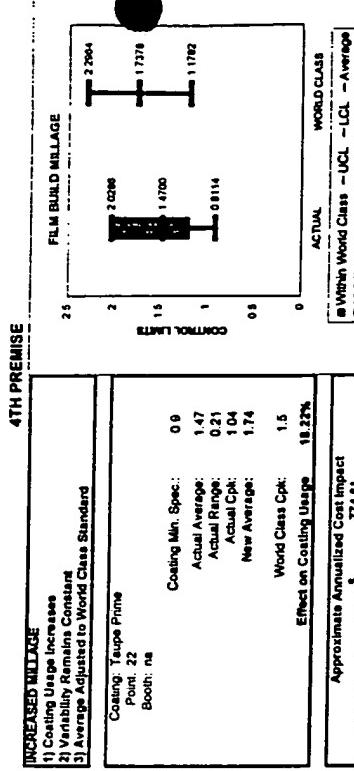
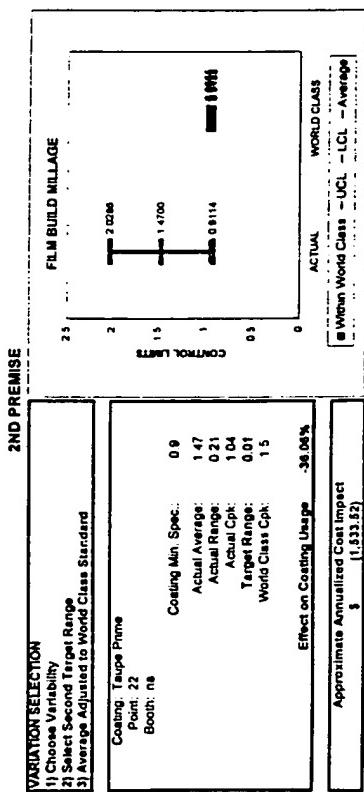
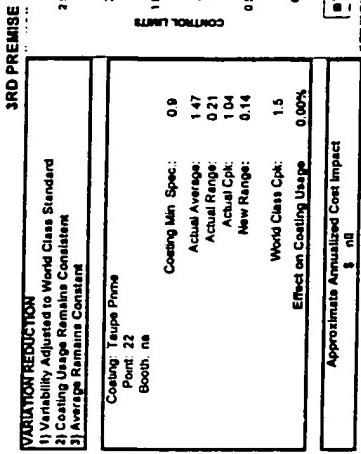
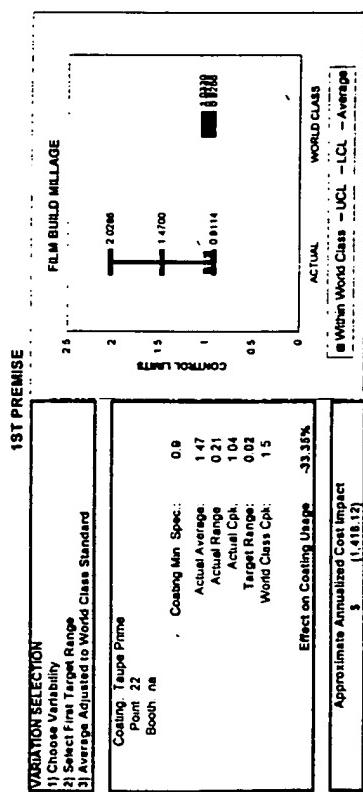
FILM BUILD SPC PAINT APPLICATIONS TEAM

Profile Includes coalitions' averages, process performance and the number of units measured.



Film Build Cpk's Cost Impact Analysis

APPENDIX D



Cost per Unit Factors:		Cost per Gallon (gal.)		Cost per Gallon (\$)		Booth % Flow.		Annualized Production (units):	
Coating:	Point:	Usage per Unit (gal.)	Cost per Gallon (\$)	Coating Popularity %:	Point %	Booth % Flow:	100	Within World Class	World Class - UCL - LCL - Average
Tape Prime	22	0.27	30.00	25	105	100	200,000		

CONSTANTS AND FORMULAS

CONSTANTS AND FORMULAS

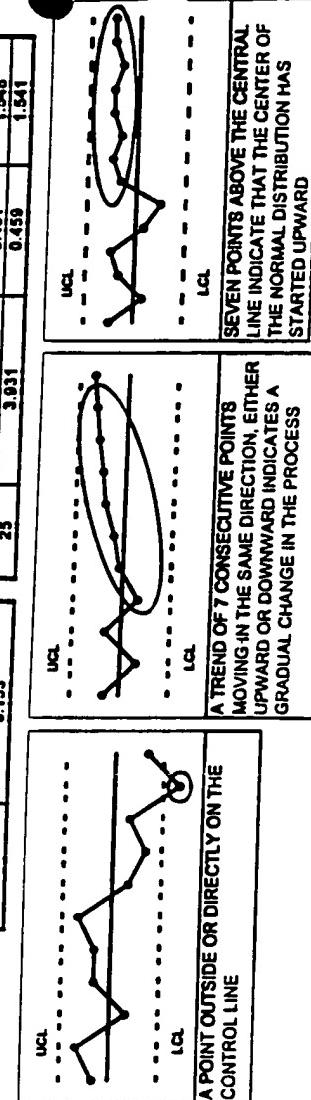
FORMULA FOR \bar{X} AND R CHARTS	
\bar{X} -Chart	R - Chart
$\bar{X} = \frac{\sum X}{n}$	$CLR = R = \frac{\sum R}{k}$
$\bar{X} = \frac{\sum X}{k}$	$UCLR = D_4 \times R$
$JCLR = \bar{X} + (A_2 \times R)$	$LCLR = D_3 \times R$
$CL\bar{X} = \bar{X} - (A_2 \times R)$	$\hat{\sigma} = \frac{R}{d_2}$
$Cp = \frac{USL - LSL}{6\hat{\sigma}}$	$Cpk = \min \left(\frac{USL - \bar{X}}{3\hat{\sigma}}, \frac{\bar{X} - LSL}{3\hat{\sigma}} \right)$

CONTROL CHARTS FOR VARIABLE DATA

X Individual Measurement X Subgroup Average X Grand Average I Sum of R Range = Highest Value - Lowest Value CL Center Line UCL Upper Control Limit LCL Lower Control Limit X Number of Subgroups n Subgroup Size s Process Standard Deviation	L Factor for \bar{X} Chart Limits D₄ Factor for UCL on R Chart D₃ Factor for LCL on R Chart USL Upper Specification Limit LSL Lower Specification Limit d₂ Factor for estimating Process Standard Deviation
--	---

APPENDIX E

Chart X		Range Chart R			
n	A₂	n	d₂	D₃	D₄
2	Upper and Lower Control Limit Factor 1.880	Subgroup Size 2	Estimate of Standard Deviation Divisor 1.128	Lower Control Limit Factor na	Upper Control Limit Factor 3.270
3	1.023	3	1.693	na	2.574
4	0.729	4	2.059	na	2.282
5	0.577	5	2.326	na	2.114
6	0.483	6	2.534	na	2.004
7	0.419	7	2.704	0.076	1.924
8	0.373	8	2.847	0.136	1.864
9	0.337	9	2.970	0.184	1.816
10	0.308	10	3.078	0.223	1.777
11	0.285	11	3.173	0.258	1.744
12	0.268	12	3.258	0.283	1.717
13	0.249	13	3.316	0.307	1.693
14	0.235	14	3.407	0.320	1.672
15	0.223	15	3.472	0.347	1.653
16	0.212	16	3.532	0.363	1.637
17	0.203	17	3.588	0.376	1.622
18	0.194	18	3.640	0.391	1.608
19	0.187	19	3.689	0.403	1.597
20	0.180	20	3.735	0.415	1.585
21	0.173	21	3.776	0.425	1.575
22	0.167	22	3.816	0.434	1.566
23	0.162	23	3.850	0.443	1.557
24	0.157	24	3.885	0.451	1.548
25	0.153	25	3.931	0.459	1.541



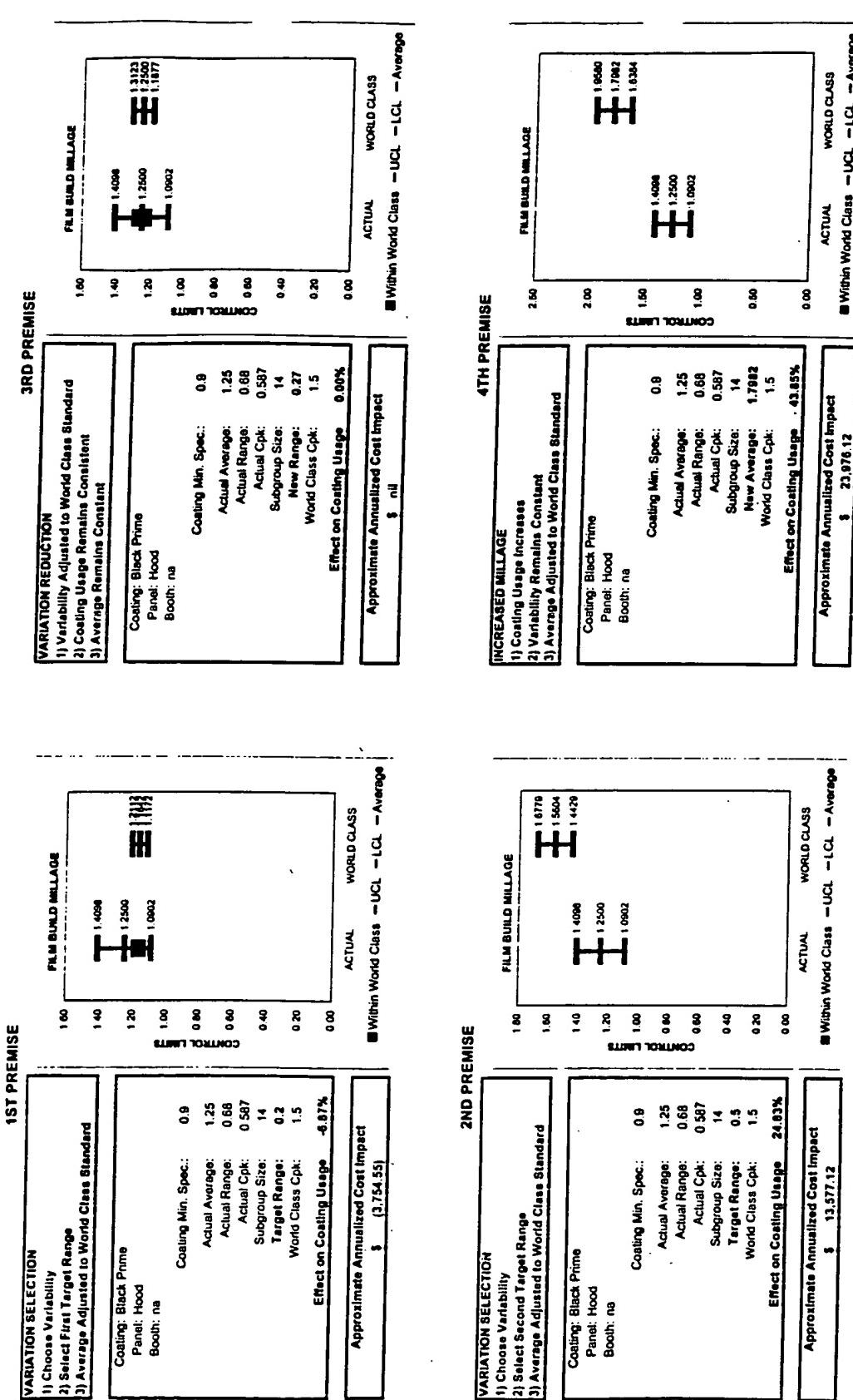
SEVEN POINTS ABOVE THE CENTRAL LINE INDICATE THAT THE CENTER OF THE NORMAL DISTRIBUTION HAS STARTED UPWARD

A TENDENCY OF 7 CONSECUTIVE POINTS MOVING IN THE SAME DIRECTION, EITHER UPWARD OR DOWNWARD INDICATES A GRADUAL CHANGE IN THE PROCESS

A POINT OUTSIDE OR DIRECTLY ON THE CONTROL LINE

Film Build Cpk's Cost Impact Analysis

APPENDIX F



Cost per Unit Factors:					
Coating:	Panet: Hood	Usage per Unit (gal.): 0.27	Cost per Gallon (\$): 27	Coating Popularity %: 25	Panet %: 15
Black Prime					Booth % Flow: 100 Annualized Production (units): 200,000

APPENDIX G

Variability Reduction Tools

Automotive Facility
Booth 2 Clear Coat Film Build Cost Analysis

<u>Panel</u>	<u>Millage Adjusted, Variability Constant</u>	<u>Range Variability Adjusted: 0.10 Mils</u>	<u>Range Variability Adjusted: 0.20 Mils</u>
Left	\$ 214,576	\$ 7,333	\$ 25,674
Right	\$ 263,413	\$ 22,571	\$ 41,838
Hood	\$ 161,393	(\$ 39,670)	(\$ 23,712)
Roof	\$ 84,819	(\$ 19,053)	(\$ 505)
Deck	\$ 40,453	(\$ 20,413)	(\$ 10,903)
Totals:	\$ 764,654	(\$ 49,232)	\$ 32,392

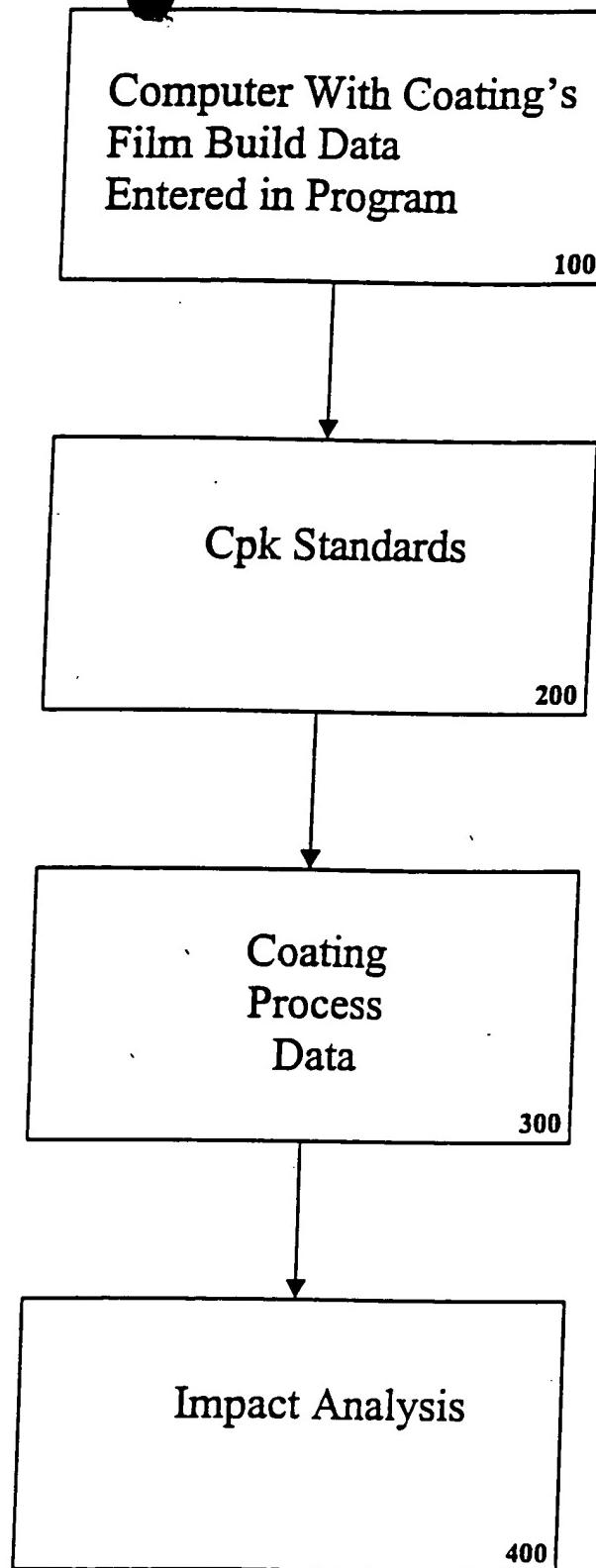


FIGURE 1

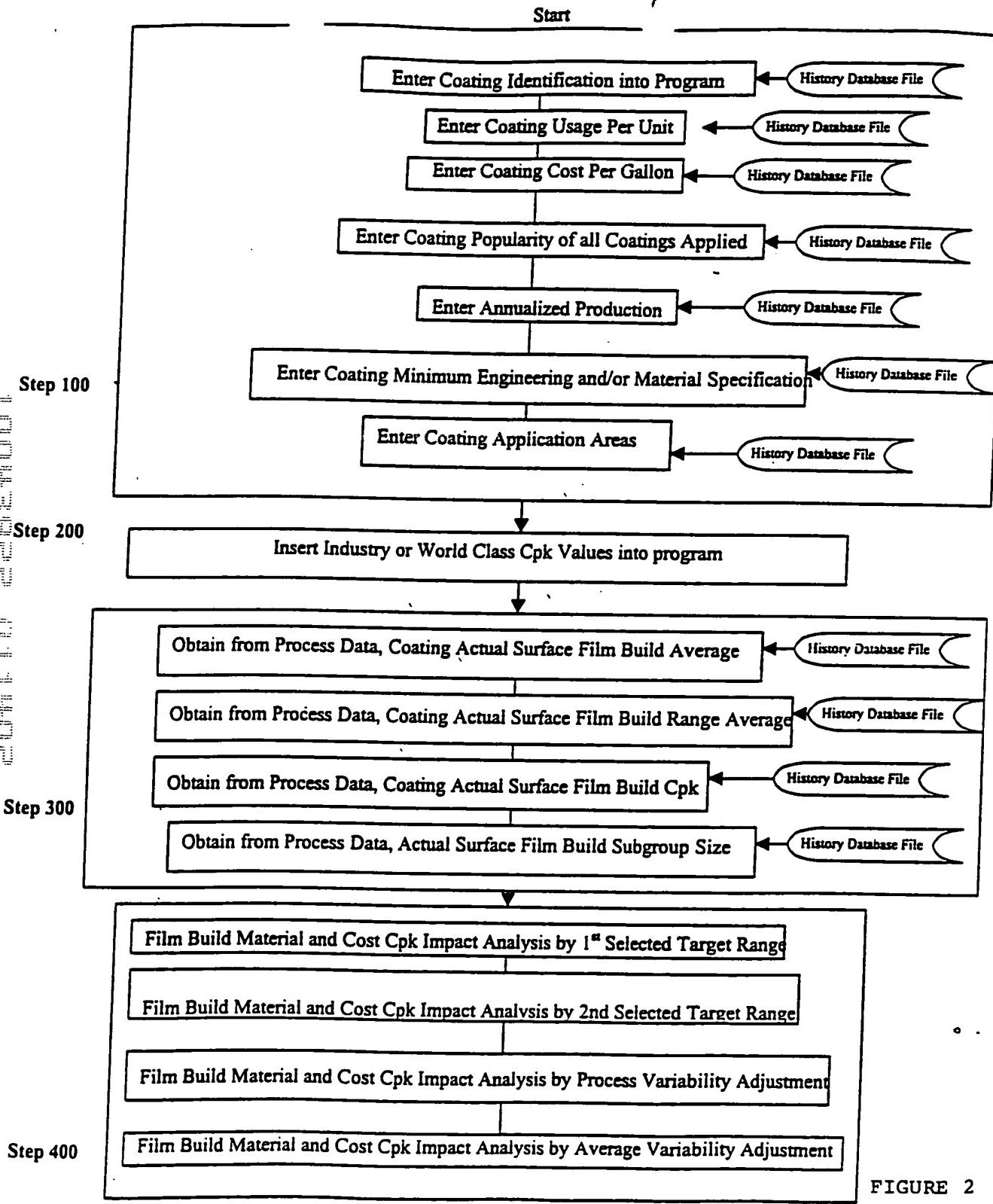


FIGURE 2